

What is claimed:

1. A method of capping a copper interconnect in a semiconductor device, the method comprising the steps of:

placing the semiconductor device in a deposition chamber over and spaced from an susceptor therein;

introducing a gas containing hydrogen into the deposition chamber to achieve a first pressure in the deposition chamber;

removing a surface oxide from the copper interconnect by introducing RF power into the deposition chamber while the gas containing hydrogen is present and without heating the semiconductor device, and stopping the RF power after a first time period;

after the first time period, heating the susceptor to about 400°C and lowering the semiconductor device onto the heated susceptor; and

while the semiconductor device is heated, introducing SiH_4 and RF power into the deposition chamber to form a SiN cap on the copper interconnect.

2. The method of claim 1, wherein the gas containing hydrogen includes NH_3 and N_2 .

3. The method of claim 1, wherein the first time period is about 10 seconds.

4. The method of claim 1, wherein the surface oxide is removed by introducing 100 W of RF power at plural megahertz for about 10 seconds.

5. The method of claim 4, wherein the RF power is at 13-14 MHZ.

6. The method of claim 1, wherein the first pressure is about 5 Torr.

7. The method of claim 1, after the SiN cap has been formed, further comprising the step of elevating the semiconductor device above the susceptor and removing the semiconductor device.